4 SAMPLING PROCEDURES

The specific methods and techniques to be used while performing sampling in accordance with the quality control protocols to meet the requirements of this QAPP are contained in the SOPs, which are included in Appendix A of the SAP (Volume II). The SAP and SOPs establish the method of sampling to comply with the following requirements.

4.1 SAMPLING PROCEDURES AND PROTOCOLS

The SAP and/or SOPs will include sampling locations, design, and sampling techniques; decontamination procedures; sampling equipment; and calibration procedures. Specific QC and documentation protocols applicable to sampling procedures are discussed in the SOPs and generally will be based on acceptable EPA and Ecology practices. Conventional sampling practices will be followed. A summary of the sample design, analytical DQOs, and analytical site performance parameters is presented in Tables 3-1 through 3-5.

4.2 SAMPLE VOLUME

The volume of samples will be established in the SAP (Volumes II) and will follow general EPA guidance and method requirements.

4.3 SAMPLE PRESERVATION

It is important to maintain the integrity of the samples from the time they are collected until the analyses are completed. The samples, therefore, will be preserved at the time of collection, and before transportation and storage to prevent or retard degradation or modification of chemicals in the samples. Sample preservation requirements are described in the SAP.

4.4 SAMPLE CUSTODY

The history of each sample and how the sample is handled is documented from the time the sample is collected through all transfers of custody until it is received at the analytical laboratory. Internal laboratory records then document the custody of the sample through final disposition. Procedures for sample custody are described below and in the SAP (Volume II).

A sample is considered to be in someone's custody if:

- It is in one's actual physical possession;
- It is in one's view, after being in one's physical possession;
- It is in one's physical possession and then locked or otherwise sealed so that tampering would be evident; or
- It is kept in a secure area, restricted to authorized personnel only.

4.4.1 SAMPLE

A sample is physical evidence collected from the environment. An essential part of sample custody is the control of this evidence gathered from the environment. To accomplish this, sample identification and chain-of-custody procedures will be followed as described in this section.

4.4.2 SAMPLE IDENTIFICATION AND LOG

The type of measurement or analysis performed on the sample determines how a sample will be identified. On-site measurements will be recorded on field data forms specified in the SAP (Volume II) including identification information, such as project code, station numbers, station location, date, time, samplers, field observations, and remarks. The authors will sign and date the completed forms using black ink and the Project Manager will maintain the forms as project records.

All collected samples will be uniquely identified by the sample label described in the SAP (Volume II). All sample labels will be filled out using dark, waterproof ink. Each sample will be designated by a unique alphanumeric code that will identify the specific sample. These samples will be placed in coolers and transported from the site location to the contract laboratory. When sent by common carrier, samples, as required, will be packaged and labeled according to procedures specified by the U.S. Department of Transportation (DOT) (Code of Federal Regulations [CFR], Section 49) in appropriate containers to maintain sample integrity. Before removal from the sample location, a sample may be separated into portions depending upon the analyses to be performed. Each portion will be preserved as necessary. The information recorded on the sample label will include the following, as appropriate:

- Project Name
- Work Charge Number
- Field Sample Number
- Sample Location
- Date
- Time
- Type of Analysis
- Preservation Notes
- Sampling Technician (initials)
- Media
- Sample Type
- Remarks (optional)
- Laboratory Number

The sample label will contain an appropriate place for designating the sample as a grab or a composite and identifying the type of sample collected for analyses. The sample label will be attached to each sample or container. After collection, separation, identification, and preservation, the sample will be maintained under chain-of-custody procedures through delivery to and analysis by the contract laboratory.

The FOLs will maintain a daily site logbook, including a summary of daily activities, observations, milestones, surveillances, checks, and other information as necessary. The logbook will be bound and weatherproof with sequentially numbered pages. The author will sign and date logbook entries, and each entry will be legibly written in dark, waterproof ink. The notations will include accurate and inclusive documentation of the individuals' daily activities, including personnel on site, weather, arrival and departure of visitors and equipment, sample pickup, logsheet numbers, start and completion of activities, health and safety issues, etc. The logbook will contain only facts and observations. Language will be objective and factual. The site logbook will be initiated at the start of the first on-site activity; entries will be made for every day that on-site activities occur. The site logbook will become part of the permanent site record and may be admitted as evidence in court. It is critical that this document be properly maintained.

If an error is made when recording information, the error may be corrected by lining through the error (so as not to obscure the original entry), entering the correct information, and initialing and dating the entry in dark, waterproof ink.

4.4.3 CHAIN-OF-CUSTODY

The samples collected during the site investigations must be traceable from the time the samples are collected until they or their derived data are used in the final report. In order to maintain and document sample possession, the following chain-of-custody procedures will be implemented.

4.4.3.1 Field Custody Procedures

- Containers will be batched in lots along with documentation to indicate their integrity. Boxes will be sealed with custody tape for shipment to the site for use. Their integrity will be determined by the FOL prior to use. Containers found to be damaged or boxes with broken seals will not be used.
- Samples will be collected as described in the SAP and attached SOPs (Volume II).
- The FOLs are responsible for the care and custody of the samples collected until they are properly transferred or dispatched to the laboratory.
- When photographs are taken as part of the documentation procedure, the name of the photographer, date, time, site location, and site description will be entered sequentially in the logbook as photographs are taken. Polaroid and developed

photographic prints will be serially numbered and dated and correspond to the logbook descriptions.

- Sample labels will be written for each sample, using dark, waterproof ink unless prohibited by weather conditions (e.g., a logbook notation would explain that a pencil was used to fill out the sample label because a ballpoint pen would not function in freezing weather).
- The FOLs, under the direction of the QC Manager, will determine whether proper custody procedures were followed during the field work and will decide if additional samples are required as a result of questionable custody procedures or documentation.
- If a sample is lost or destroyed during shipment, a written statement will be prepared by the FOL and given to the Project Manager and QC Manager detailing how the sample was collected and shipped to the laboratory. The statement will include all pertinent information, such as entries in the field logbooks regarding the sample, whether the sample was in the sample collector's physical possession or in a locked compartment until shipped to the laboratory, the shipper and associated shipping records, existing custody terms, and ultimate fate (if known) of the sample (EPA, 1978).

4.4.3.2 Transfer of Custody and Shipment

- All laboratory samples will be accompanied by a chain-of-custody record. An example of the chain-of-custody form to be used is included in the SAP. The custody record will be written using dark, waterproof ink. Any corrections will be made by drawing a line through, initialing and dating the change, then entering the correct information. Erasures or white-outs will not be permitted. When transferring the possession of samples, the individuals relinquishing and receiving the samples will sign, date, and note the time on the chain-of-custody record. This record documents sample custody transfer from the sampler, often through another person or common carrier, to the analyst in the laboratory and throughout the laboratory procedures.
- Samples will be packaged according to DOT and sample preservation requirements for shipment and dispatched to the laboratory for analysis, with a duplicate custody record copy accompanying each shipment (e.g., one for the field, one for samples shipped to the off-site laboratory). All samples will be placed in coolers along with appropriate chain-of-custody forms. Each individual container will be sealed with custody tape (unless the container is tarred and/or is not appropriate for sealing). Samples and forms will be enclosed in waterproof plastic bags that are sealed. Empty space within the cooler shall be filled with bubble wrap, styrofoam beads, vermiculite, or other materials to prevent shifting or breakage during shipment. Shipping containers will be sealed for shipment to the laboratory and a custody seal will be placed over the top and side of the lid at the most likely point of rupture to ensure the package

has not been tampered with. The sampler or designated sample packager will initial and date this seal. The method of shipment, courier name(s), and other pertinent information will be entered in the "Remarks" section on the custody record.

- If any samples are split or are for inter-laboratory comparison, a separate Receipt for Samples form will be prepared for those samples and marked to indicate for whom the samples are being split. The person relinquishing the samples to the facility or agency will obtain the required signature of a representative of the appropriate party to acknowledge receipt of the samples. If a representative is unavailable or refuses to sign, this will be noted in the "Received by" space. When appropriate, as in the case where the representative is unavailable, the custody record will contain a statement that the samples were delivered to the designated location at the designated time. This disposition does not jeopardize the chain-of-custody for the split sample portion retained for analysis by Foster Wheeler.
- All shipments will be accompanied by the chain-of-custody record to identify contents. The original record will accompany the shipment, and the copy will be retained by the FOLs for inclusion in project records.
- All samples to be shipped to a laboratory will be shipped by express mail service for overnight delivery. The package will be registered with return receipt requested. If sent by common carrier or airfreight, proper documentation will be maintained.

4.4.3.3 Laboratory Custody Procedures

- A sample custodian or designated alternate accepts custody of the shipped samples and verifies that the information on the sample labels matches the information on the chain-of-custody records. Pertinent information such as shipment, pickup, courier, etc. will be entered in the "Remarks" section. The custodian then enters the sample label data into the sample tracking system of the laboratory. This system will use the sample label number or assign a unique laboratory number to each sample label and will ensure that all samples are transferred to the proper analyst and are stored in the appropriate secure area according to method specifications.
- Samples are distributed to the appropriate analysts as described in the laboratory procedures. Laboratory personnel are responsible for the care and custody of samples from the time they are received until the sample is exhausted or dispersed. All samples and extracts will be held for a minimum of 30 days or until the end of project, whichever is greater. Archived samples must be kept in a preserved state until released by the Foster Wheeler Project Manager or designee (typically QC Manager).

- When sample analyses and necessary QA checks have been completed in the laboratory, the unused portion of the sample and the sample container must be properly disposed of in accordance with all federal and state laws, rules, and regulations. Sample and extract disposal will be the responsibility of the laboratory. All identifying tags, data sheets, chain-of-custody, and laboratory records will be retained as part of the permanent documentation. Samples received by the laboratory will be retained until analyses and QA checks are completed.